

REMARKS

Summary of Amendments

Claims 1 through 4 were originally presented in this application. Claim 1 has been amended, as described in more detail below, to more particularly point out and distinctly claim the subject matter of the invention. Claim 5 has been added. Accordingly, claims 1 through 5 are pending.

Claim Rejections – 35 U.S.C. § 102

1. Claims 1 through 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Araki et al.* (U.S. Pat. No. 6,239,402) in view of *Ohashi et al.* (U.S. Pat. No. 6,261,708) as evidenced by *Soma et al.* (U.S. Pat. No. 5,231,690). In particular, the Examiner states:

Araki et al. disclose an aluminum nitride based wafer holder for semiconductor manufacturing device[s] (Fig. 8) with a shaft (28) or wafer holder (Fig. 9) with a shaft (34) and an electrical circuit formed inside (7 for resistive heating and 9 for plasma) and electrodes for supplying power. The heat capacity of the electrodes could be fairly estimated to be less than 2 J/gK.

The Examiner goes on to state:

The heat capacity of the wafer holder however could be fairly estimated to be more than 350 J/gK for the wafer holder of Fig. 9 and much larger for the wafer holder of Fig. 8. Therefore the heat capacity of the electrodes of the disclosed wafer holder would be much less than 10%.

The Examiner further states: "Ohashi et al. teach a method of joining a shaft and a wafer holder and teach that respective surfaces are smoothed to less than 2 μm ."

2. Applicants respectfully traverse this rejection to the extent that it is pertinent to amended claim 1. Claim 1 has been amended to recite: "a plurality of electrodes within said shaft, for supplying power to said electrical circuit, the electrodes having a length of at least half the diameter of the wafer-carrying surface." This amendment to claim 1 is supported in the original specification, such that no new matter has been added. For example, Embodiment 1 discloses electrodes having a length of about 300 mm as compared to a wafer-carrying surface diameter of 340 mm.

3. Applicants respectfully submit that claim 1, as amended, now distinguishes patentably over *Araki et al.* in view of *Ohashi et al.* as evidenced by *Soma et al.* In particular, there is nothing in *Araki et al.* that teaches or suggests that the length of the electrodes is at least half the diameter of the wafer-carrying surface within the shaft, as now recited in claim 1. On the contrary, *Araki et al.* discloses electrodes having a length significantly less than half the diameter of the wafer-carrying surface. In Example 55 (column 17, lines 65-66), *Araki et al.* teach a shaft (heat insulating portion 28 shown in Fig. 8) having a length of only 20 mm, which is only 1/12 of the diameter of the substrate (20 mm to 240 mm). In Example 58 (column 19, lines 27-30), *Araki et al.* teach a shaft (heat insulating portion 28a shown in Fig. 9) having a length of only 18 mm. Based on the proportions of Fig. 9, the spacer 34 and bonding layers 35 would be expected to have a cumulative length (thickness) of no more than 12 mm, which would result in a total shaft length of 30 mm (if the spacer 34 and bonding layers 35 are accounted as part of the shaft). Thus, *Araki et al.* teach a shaft length of no greater than 1/8 the diameter of the wafer-carrying surface (30 mm to 240 mm). Accordingly, Applicants submit that claim 1 now distinguishes patentably over *Araki et al.*
4. Applicants present new dependent claim 5 for consideration in this paper. New claim 5 depends from independent claim 1 and is supported by the original specification, such that no new matter has been added. New claim 5 recites: "the heat capacity of each of the plurality of electrodes is 1% or less of the heat capacity of the region of the wafer holder that corresponds to inside the outer periphery of the shaft." This amendment is supported, for example, by Table I, which shows heat capacity percentages of 1.8, 3.7, 5.6, 7.5, and 9.3 percent for devices having 2, 4, 6, 8, and 10 electrodes, respectively. New claim 5 is also supported by Table II.
5. Applicants respectfully submit that new claim 5 is allowable for the same reasons as independent claim 1 from which it depends. New claim 5 is further distinct from the prior art of record in that it recites a heat capacity ratio of 1 percent or less for each of the electrodes. There is no evidence in *Araki et al.* (or *Soma et al.*) that the heat capacity of each electrode is 1 percent or less of the heat capacity of the region of the wafer holder inside the outer periphery of the shaft.
6. Applicants respectfully submit that independent claim 1, as amended, is allowable over the prior art of record. Claim 1 being allowable, it follows that dependent claims 2-5 must also be allowable.

App. No. 10/604,133
Amendment dated September 21, 2006
Reply to Office action of March 21, 2006

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

September 21, 2006

/James Judge/

James W. Judge
Registration No. 42,701

JUDGE & MURAKAMI IP ASSOCIATES
Dojima Building, 7th Floor
6-8 Nishitemma 2-Chome, Kita-ku
Osaka-shi 530-0047
JAPAN

Telephone: **305-938-7119**
Voicemail/Fax: **703-997-4565**